

**Notice of Allowability**

Application No.

10/787,251

Examiner

John H. Le

Applicant(s)

SLOTHERS ET AL.

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2863

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 01/30/2006.
2. ☒ The allowed claim(s) is/are 1-66 and 68-81.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |  |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                    |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|   | 9. <input type="checkbox"/> Other _____.   |

***Examiner's Amendment***

***Response to Amendment***

1. Applicant's amendment filed 01/30/2006 has been entered and carefully considered.

Claims 19, 61, 64, 66, 68, 69, 73, 75, 77, and 78 have been amended.

Claims 80 and 81 have been added.

Claim 67 has been cancelled.

***Examiner's Amendment***

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The applicant has been amended as follows:

The abstract has been replaced as follows:

Apparatus for generating an output dependent upon the impedance or at least one component of the impedance of a device ~~comprises~~ includes a load component having a known impedance or component thereof for connection in series with said the device; a measurement channel for measuring voltages; a switch arrangement connected to said the measurement channel for switching the measurement channel to sequentially measure a first voltage on a first side of said the load component and a second voltage on a second side of said the load component or a voltage difference across said the load component; a processing arrangement connected to said the

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measurement channel for processing the sequentially measured voltages to generate an output dependent upon said the impedance or at least one component of the impedance of said the device; and a signal generating arrangement for generating an electrical signal for application to the series connected load component and device.

***Reasons for Allowance***

3. Claims 1-66, and 68-81 are allowed.
4. The following is a statement of reasons for the indication of allowable subject matter:

Please see the previous office action and applicant's argument filed on 01/30/2006.

Regarding claim 1, none of the prior art of record teaches or suggests the combination of an apparatus for generating an output dependant upon the impedance or at least one component of the impedance of a device, wherein the apparatus comprising: a signal generating arrangement for generating an electrical signal for application to the series connected load component and device; a switch arrangement connected to said measurement channel for switching the measurement channel to sequentially measure a first voltage on a first side of said load component, and one of a second voltage on a second side of said load component or a voltage difference across said load component. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 19, none of the prior art of record teaches or suggests the combination of a method of generating an output dependent upon the impedance or at least one component of the impedance of a device, wherein the method comprising: applying an electrical signal to the series connected load component and device; using a measurement channel to sequentially measure a first voltage on a first side of said load component, and one of a second voltage on a second side of said load component or a voltage difference across said load component. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 38, none of the prior art of record teaches or suggests the combination of apparatus for generating an output dependent upon the impedance or at least one component of the impedance of a device, the apparatus comprising: a signal processing arrangement for processing the measurements to generate an output dependent upon the impedance or at least one component of the impedance of the device, wherein said processing arrangement is adapted to: determine a first parameter indicative of the complex amplitude of the first voltage on a first side of said load component connected to said device, and a second parameter indicative of the complex amplitude of said difference voltage or a calculated difference voltage comprising the difference between the first and second voltages; multiply each of the first and second determined parameters by the complex conjugate of the second determined parameter to generate third and fourth parameters respectively; and compare said third and fourth

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parameters to generate an output or compare one or more components or derivatives of the third parameter and said fourth parameter to generate said output. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 48, none of the prior art of record teaches or suggests the combination of a method of generating an output dependent upon the impedance or at least one component of the impedance of a device, the method comprising: processing the measurements to generating an output dependent upon the impedance or at least one component thereon wherein said processing comprises: determining a first parameter indicative of the complex amplitude of the first voltage on a first side of said load component connected to said device, and a second parameter indicative of the complex amplitude of said difference voltage or a calculated difference voltage comprising the difference between the first and second voltages; multiplying each of the first and second determined parameters by the complex conjugate of the second determined parameter to generate third and fourth parameters respectively; and comparing said third and fourth parameters to generate said output or comparing one or more components or derivatives of the third parameter and said fourth parameter. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 59, none of the prior art of record teaches or suggests the combination of an apparatus for generating an output in dependence upon the impedance or at least one component of the impedance of a device, the apparatus comprising: a generator arrangement for applying a voltage signal to the series connected load component and device; a switch arrangement for switching the measurement channel to sequentially measure a first voltage one side of said load component and a second voltage on the other side of said load component or a difference voltage across said load component. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 60, none of the prior art of record teaches or suggests the combination of a method of generating an output in dependence upon the impedance or at least one component of the impedance of a device, wherein the method comprising: applying a voltage signal to the series connected load component and device; sequentially measuring a first voltage one side of said load component and a second voltage on the other side of said load component or a difference voltage across said load component using a measurement channel. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 61, none of the prior art of record teaches or suggests the combination of a method of calibrating an apparatus, the apparatus being adapted to generate an output in dependence upon the impedance or at least one component of the impedance of a device, the apparatus including a load component having an unknown impedance or at least one component thereof, and wherein the method comprising: connecting a test load component having a known impedance or at least one component thereof to said apparatus in place of said device and in series with said load component; applying a voltage signal across said series connected test load component and load component; processing the measurements to determine a value dependent upon the impedance or at least one component of the impedance of the load component; and storing the determined value for later use in the generation of an output. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 64, none of the prior art of record teaches or suggests the combination of an apparatus for generating an output in dependence upon the impedance or at least one component of the impedance of a device, wherein the apparatus comprising: a generator arrangement for applying a voltage signal to said series connected load component and device; a measurement arrangement adapted to measure the voltage across said device and a voltage drop across said load component to obtain a measurement of the current in said device; a test load component having a known impedance or at least one component of the impedance for connection in place

of said device and in series with said load component for calibration of said load component; calibration processing means for processing the measurements when said test load component is connected in place of said device to determine and store a value dependent upon the impedance or at least one component of the impedance of the load component. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 66, none of the prior art of record teaches or suggests the combination of a method of identifying a device having an impedance characteristic as a function of frequency, wherein the method comprising: determining first and second parameters indicative of the complex amplitude at said first and second frequency respectively of the first voltage on a first side of said load component connected to said device; determining third and fourth parameters indicative of the complex amplitude at said first and second frequency respectively of said difference voltages or a calculated difference voltage comprising the difference between the first and second voltages; multiplying each of the first and third determined parameters by the complex conjugate of the third determined parameter to generate fifth and sixth parameters respectively; multiplying each of the second and fourth determined parameters by the complex conjugate of the fourth determined parameter to generate seventh and eighth parameters respectively; and performing a comparison using said fifth sixth, seventh and eighth parameters to determine said value or performing a comparison using one or more components or derivatives of said fifth, sixth; seventh and eighth parameters to



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determine said value. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 69, none of the prior art of record teaches or suggests the combination of a method of identifying a device having an impedance characteristic as a function of frequency, wherein the method comprising: obtaining first and second parameters indicative of the complex amplitude at said first and second frequency respectively of the first voltage on a first side of said load component connected to said device; obtaining third and fourth parameters indicative of the complex amplitude at said first and second frequency respectively of said difference voltages or a calculated difference voltage comprising the difference between the first and second voltages; multiplying each of the first and third parameters by the complex conjugate of the third determined parameter to generate fifth and sixth parameters respectively; multiplying each of the second and fourth parameters by the complex conjugate of the fourth determined parameter to generate seventh and eighth parameters respectively. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 70, none of the prior art of record teaches or suggests the combination of a proximity sensor for sensing the proximity of a target comprising: a switch connected to switch between said first end of said impedance component and a second end of said impedance component; a signal generator connected to said second

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end of said impedance component for generating an electrical signal for application to the impedance component and electrical component; an analogue-to-digital converter for receiving a digital signal and for generating a proximity signal, wherein said processor is adapted to control said switch to switch to connect to said first and second ends of said impedance component sequentially; and a processor connected to the analogue-to-digital converter for receiving a digital voltage signal and for generating a proximity signal, wherein said processor is adapted to control said switch to switch to connect to said first and second ends of said impedance component sequentially. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 73, none of the prior art of record teaches or suggests the combination of an apparatus for generating an output dependent upon the impedance or at least one component of the impedance of a device, wherein the apparatus comprising: a generator arrangement for applying a voltage to the series connected load component and device; a measurement arrangement adapted to measure a first voltage one side of said load component, and a second voltage on the other side of said load component or a difference voltage comprising the voltage difference across said load device; and a signal processing arrangement for processing the measurements to generate an output dependent upon the impedance of said device; wherein said signal processing arrangement is adapted to monitor said measurements to detect fault conditions in said device and to output a warning output if a fault condition is detected..

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It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 75, none of the prior art of record teaches or suggests the combination of a method for generating an output dependent upon the impedance or at least one component of the impedance of a device, wherein the method comprising: applying a voltage to the series connected load component and device; measuring a first voltage on one side of said load component, and a second voltage on the other side of said load component or a difference voltage comprising the voltage difference across said load device; monitoring said measurements to detect fault conditions in said device and outputting a warning output if a fault condition is detected. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 77, none of the prior art of record teaches or suggests the combination of a method of identifying a device having an impedance characteristic as a function of frequency, wherein the method comprising: processing said measurements in a multiplicative and non divisional manner to determine if a first impedance or part of the impedance of the device at a first frequency has a predefined inequality relationship with a second impedance or part of the impedance of the device at a second frequency, without calculating either impedance; and identifying the device in dependence upon the predefined inequality relationship. It is these limitations as they are claimed in the

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combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

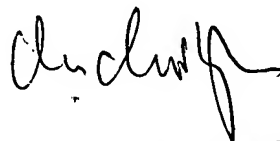
***Contact Information***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John H. Le whose telephone number is 571 272 2275. The examiner can normally be reached on 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on 571 272 2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John H. Le  
Patent Examiner-Group 2863  
March 30, 2006



MICHAEL NGHIEM  
PRIMARY EXAMINER